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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/995,704	11/29/2001	Jong Won Seok	P67356US0	2611

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EXAMINER

HENNING, MATTHEW T

ART UNIT	PAPER NUMBER
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2131

DATE MAILED: 12/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/995,704

Applicant(s)

SEOK ET AL.

Examiner

Matthew T. Henning

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1 This action is in response to the communication filed on 9/1/2006.

2 **DETAILED ACTION**

3 *Response to Arguments*

4 Applicant's arguments with respect to claims 1-14 have been considered but are moot in
5 view of the new ground(s) of rejection.

6 Claims 1-14 have been examined.

7 All rejections presented in the final action dated 8/26/2005 have been maintained.

8 *Claim Rejections - 35 USC § 103*

9 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all
10 obviousness rejections set forth in this Office action:

11 *A patent may not be obtained though the invention is not identically disclosed or*
12 *described as set forth in section 102 of this title, if the differences between the subject matter*
13 *sought to be patented and the prior art are such that the subject matter as a whole would have*
14 *been obvious at the time the invention was made to a person having ordinary skill in the art to*
15 *which said subject matter pertains. Patentability shall not be negated by the manner in which*
16 *the invention was made.*
17

18 Claims 1-3, and 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lam
19 et al. (US Patent Number 5,940,429) hereinafter referred to as Lam, and further in view of Preuss
20 et al. (US Patent Number 5,319,735) hereinafter referred to as Preuss.

21 Regarding claim 1, Lam disclosed an apparatus for embedding a watermark into an
22 original audio signal (See Lam Fig. 5(b) element s(n)), comprising: a linear prediction analysis
23 means for generating a prediction coefficient of the original audio signal by means of a linear
24 prediction analysis after the original audio has been inputted thereto (See Lam Fig. 5(b) Element
25 88 and Col.8 Last Paragraph); a residual signal output means (See Lam Fig. 5(b) Element 104)

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1 for outputting a residual signal of a the original audio signal by filtering the original audio signal
2 using the prediction coefficient generated from the linear prediction analysis means (See Lam
3 Col. 8 Line 6 – Col. 9 Line 4); an echo signal generation means (See Lam Fig. 5(b) Element 94)
4 for generating an echo signal of the original audio signal by synthesizing the prediction
5 coefficient of the original audio signal and the residual signal of the original audio signal (See
6 Lam Col. 9 Lines 43-48); and a copyright information insertion means for generating a
7 watermarked audio signal by combining the original audio signal and the echo signal of the
8 original audio signal having copyright information therein (See Lam Fig. 5(b) Element 100 and
9 Col. 9 Lines 49-53), but Lam failed to disclose delaying the original audio signal prior to
10 inputting it to element 104).

11 Preuss teaches that in order to compensate for delays introduced by various processing
12 steps in a signal embedding system, delays can be introduced into an audio signal (See Preuss
13 Col. 6 Last Paragraph).

14 It would have been obvious to the ordinary person skilled in the art at the time of
15 invention to employ the teachings of Preuss in the audio processing system of Lam by delaying
16 the original audio signal $s(n)$ prior to input to element 104. This would have been obvious
17 because the ordinary person skilled in the art would have been motivated to delays introduced by
18 the LPC analysis 88.

19 Regarding claim 8, Lam disclosed a method for embedding a watermark into an
20 original audio signal, the method comprising the steps of: a) generating a prediction coefficient
21 based on the original audio signal by means of the linear prediction analysis (See Lam Fig. 5(b)
22 Element 88 and Col.8 Last Paragraph); b) outputting a residual signal of the audio signal by

1 filtering the original audio signal and eliminating an inherent spectrum of the audio signal, using
2 the prediction coefficient of the original audio signal (See Lam Col. 8 Line 6 – Col. 9 Line 4); c)
3 outputting a synthesis signal by using the prediction coefficient of the original audio signal and
4 the residual signal of the original audio signal (See Lam Col. 9 Lines 43-48); d) granting an error
5 correction function to the copyright information (See Lam Col. 7 Lines 51-57); e) assigning a
6 sign to the synthesis signal after an error corrected copyright information is inputted thereto (See
7 Lam Fig. 5(b) Elements 90, 94, and 98 and Col. 7 Lines 63-67); and f) outputting a watermarked
8 audio signal by adding the original audio signal and the synthesis signal that a predetermined
9 sign has been assigned (See Lam Fig. 5(b) Element 100 and Col. 9 Lines 49-53), but Lam failed
10 to disclose delaying the original audio signal prior to inputting it to element 104).

11 Preuss teaches that in order to compensate for delays introduced by various processing
12 steps in a signal embedding system, delays can be introduced into an audio signal (See Preuss
13 Col. 6 Last Paragraph).

14 It would have been obvious to the ordinary person skilled in the art at the time of
15 invention to employ the teachings of Preuss in the audio processing system of Lam by delaying
16 the original audio signal $s(n)$ prior to input to element 104. This would have been obvious
17 because the ordinary person skilled in the art would have been motivated to delays introduced by
18 the LPC analysis 88.

19 Regarding claims 9 and 14, Lam disclosed an apparatus for detecting a watermark from a
20 watermarked audio signal, the apparatus comprising: a linear prediction analysis means for
21 generating a prediction coefficient by means of the linear prediction analysis of the watermarked
22 audio signal (See Lam Fig. 6 Element 116 and Col. 14 Lines 1-7); a linear prediction analysis

1 filter for outputting a residual signal by eliminating an inherent spectrum of the original audio
2 signal after filtering the watermarked audio signal using the prediction coefficient (See Lam Fig.
3 6 Element 114 and Col. 14 Lines 7-29); a short-time autocorrelation means for calculating an
4 autocorrelation using the residual signal outputted from the linear prediction analysis filter (See
5 Lam Fig. 6 Elements 118, 120, and 122 and Col. 14 Lines 30-42); and a sign detection means for
6 detecting copyright information after detecting a sign of the value outputted from the short-time
7 autocorrelation means (See Lam Col. 14 Lines 30-42); but Lam failed to disclose that the
8 watermarked audio signal uses a residual signal of a delayed version of the original audio signal
9 that is delayed for a predetermined delay time (T).

10 Preuss teaches that in order to compensate for delays introduced by various processing
11 steps in a signal embedding system, delays can be introduced into an audio signal (See Preuss
12 Col. 6 Last Paragraph).

13 It would have been obvious to the ordinary person skilled in the art at the time of
14 invention to employ the teachings of Preuss in the audio processing system of Lam by delaying
15 the original audio signal $s(n)$ prior to input to element 104. This would have been obvious
16 because the ordinary person skilled in the art would have been motivated to delays introduced by
17 the LPC analysis 88.

18 Regarding claim 2, Lam and Preuss disclosed that the linear prediction analysis means
19 generates the prediction coefficient which is able to predict an inherent spectrum of the audio by
20 virtue of the linear prediction analysis (See Lam Col. 8 Lines 8-24).

21 Regarding claim 3, Lam and Preuss disclosed that the residual signal output means
22 includes: a delay means for delaying the original signal for a predetermined delay time (See the

1 rejection of claim 1 above); and a linear prediction analysis filter for outputting the residual
2 signal by eliminating the inherent spectrum of the delayed version of the original audio signal
3 after filtering the delayed original audio signal using the prediction coefficient (See the rejection
4 of claim 1 above and Fig. 5(b) Element 104 and Col. 8 Line 60 – Col. 9 Line 4).

5 Regarding claim 5, Lam and Preuss disclosed that the echo signal generation means is a
6 linear prediction synthesis filter for outputting the echo signal of the original audio signal by
7 synthesizing the prediction coefficient of the original audio signal outputted from the linear
8 prediction analysis means and the residual signal of the delayed version of the original audio
9 signal outputted from the residual signal output means (See Lam Col. 9 Lines 43-48).

10 Regarding claim 6, Lam and Preuss disclosed that the copyright information insertion
11 means includes: an error correction encoder for granting an error correction function to the
12 copyright information embedded into the original audio signal (See Lam Fig. 5(b) Element 86
13 and col. 7 Lines 51-62); a sign generator for assigning a sign to the echo signal of the original
14 audio signal outputted from the echo signal generation means according to an error-corrected
15 copyright information outputted from the error correction encoder (See Lam Col. 7 Line 51-67
16 and Col. 8 Lines 25-31); and a summer for outputting a watermarked audio signal by adding a
17 sign-assigned signal outputted from the sign generator and the original audio signal (See Lam
18 Col. 7 Lines 45-59).

19 Regarding claim 7, Lam and Preuss disclosed the error correction encoder outputs each
20 different value, i.e., 0 or 1, according to the copyright information, the sign generator assigns a
21 positive sign or a negative sign to the echo signal of the original audio signal and the summer
22 outputs the watermarked audio signal having the copyright information therein by adding the

1 echo signal to the original audio signal or subtracting the echo signal from the original audio
2 signal (See Lam Col. 7 Lines 51-67 and Col. 8 Lines 45-59, although Lam did not explicitly state
3 “subtraction”, Lam did disclose assigning a negative value to the watermark data and then
4 adding it to the original signal, and adding a negative number is the same as subtraction).

5 Regarding claim 10, Lam and Preuss disclosed an error correction decoder for outputting
6 the error-corrected copyright information through an error-correction decoding step after the
7 resultant output sign detected from the sign detector 204 is inputted thereinto (See Lam Fig. 6
8 Element 126 and Col. 14 Lines 47-49).

9 Regarding claim 11, Lam and Preuss disclosed that the linear prediction analysis means
10 generates the residual signal by combining the residual signal of the original audio signal and the
11 residual signal of the delayed version of the original signal (See Lam Col. 14 Lines 16-29).

12 Regarding claim 12, Lam and Preuss disclosed that the short-time autocorrelation means
13 finds out the residual signal of the original audio signal and the residual signal of the delayed
14 version of the original audio signal by calculating the autocorrelation of the residual signal (See
15 Lam Col. 14 Lines 39-46).

16 Regarding claim 13, Lam and Preuss disclosed that the sign detection means investigates
17 a correlation sign of the residual signal of the original audio signal and the residual signal of the
18 delayed version of the original signal, thereby outputting an output value, i.e., 0 or 1, according
19 to the correlation sign (See Lam Col. 14 Lines 35-46).

20 Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of
21 Lam and Preuss as applied to claim 3 above, and further in view of Hannigan et al. (US Patent
22 Number 6,674,876) hereinafter referred to as Hannigan.

4 Hannigan teaches that in an audio watermarking system, introduced delay times are the
5 key to the detection of the watermark (See Hannigan Col. 8 Lines 17-32).

6 It would have been obvious to the ordinary person skilled in the art at the time of
7 invention to employ the teachings of Hannigan in the watermarking system of Lam and Preuss
8 by using the introduced delay time as a key to detecting the watermark. This would have been
9 obvious because the ordinary person skilled in the art would have been motivated to protect
10 recovery of the embedded data.

11. *Conclusion*

12 Claims 1-14 have been rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this
Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).
Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

16 A shortened statutory period for reply to this final action is set to expire THREE
17 MONTHS from the mailing date of this action. In the event a first reply is filed within TWO
18 MONTHS of the mailing date of this final action and the advisory action is not mailed until after
19 the end of the THREE-MONTH shortened statutory period, then the shortened statutory period
20 will expire on the date the advisory action is mailed, and any extension fee pursuant to 37
21 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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1 however, will the statutory period for reply expire later than SIX MONTHS from the date of this
2 final action.

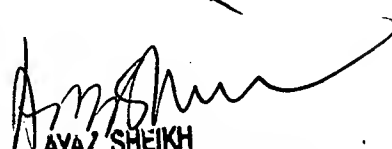
3 Any inquiry concerning this communication or earlier communications from the
4 examiner should be directed to Matthew T. Henning whose telephone number is (571) 272-3790.

5 The examiner can normally be reached on M-F 8-4.

6 If attempts to reach the examiner by telephone are unsuccessful, the examiner's
7 supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the
8 organization where this application or proceeding is assigned is 571-273-8300.

9 Information regarding the status of an application may be obtained from the Patent
10 Application Information Retrieval (PAIR) system. Status information for published applications
11 may be obtained from either Private PAIR or Public PAIR. Status information for unpublished
12 applications is available through Private PAIR only. For more information about the PAIR
13 system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR
14 system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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